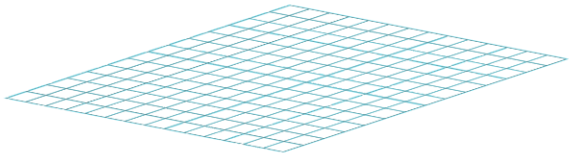
Code specs | RK4 Integrator

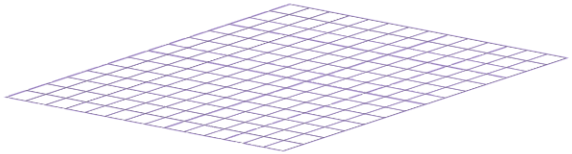
A more optimal implementation: $4N^3$



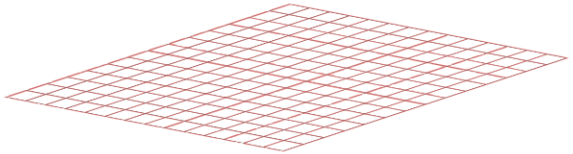
y_n

$y_x = 0$

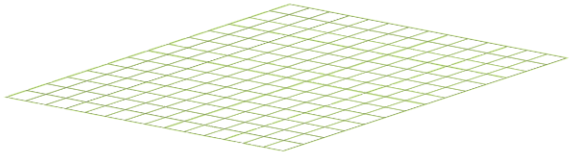
$y_{k_1} = y_n + \frac{h}{2} f(t_n,\ y_n)$ $\quad y_x \mathrel{+}= y_{k_1}$



$y_{k_2} = y_n + \frac{h}{2} f\left(t_n + \frac{h}{2},\ y_{k_1}\right)$ $\quad y_x \mathrel{+}= 2y_{k_2}$



$y_{k_3} = y_n + h\, f\left(t_n + \frac{h}{2},\ y_{k_2}\right)$ $\quad y_x \mathrel{+}= y_{k_3}$

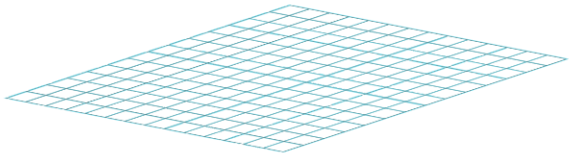


$$y_{n+1} = \frac{1}{3}(y_x - y_n) + \frac{1}{6}hf\left(t_n + h, y_{k_3}\right)$$

Code specs | RK4 Integrator

Given a starting y_p, compute internally or externally

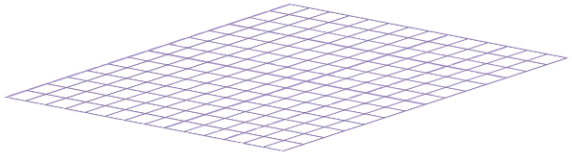
$y_a = y_p, y_f = 0$



$y_c = f(y_a)$

$y_f \mathrel{+}= y_c/6; \quad y_c = y_p + \frac{h}{2} y_c$

$y_c \leftrightarrow y_a$



$y_c = f(y_a)$

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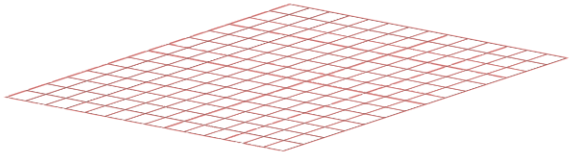
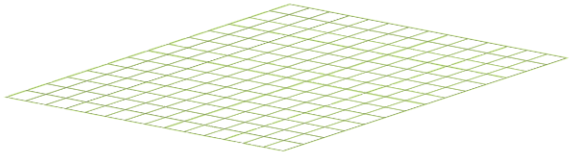


$y_c = f(y_a)$

$y_f \mathrel{+}= y_c/3; \quad y_c = y_p + h y_c$

$y_c \leftrightarrow y_a$



$y_c = f(y_a)$

$y_f = y_p = y_p + h\, y_f + \frac{1}{6} h y_c$